REMARKS

Reconsideration and allowance in view of the foregoing Amendment and the following remarks are respectfully requested.

By this Amendment, claims 8-12 and 14-24 are pending in the application. Claims 6, 7 and 25 have been cancelled herein without prejudice or disclaimer. Claims 19-24 are withdrawn from consideration.

Claim rejections – 35 USC 112

The Examiner rejected claims 6-12, 14-18 and 25 under 35 U.S.C. § 112, second paragraph.

Claims 6, 7 and 25 have been canceled herein without prejudice or disclaimer. Therefore, the rejection of claims 6 and 7 under § 112, second paragraph is rendered moot.

With regard to claims 8, 9 and 25, the Applicant has amended claims 8 and 9 and replaced the phrase "a light beam" by the phrase "the light beam," as suggested by the Examiner.

With regard to claims 10-12, the Applicant has amended claims 10-12 to recite "at least one of said first prism member and said second prism member."

With regard to claim 14, the Applicant has amended claim 14 to recite "wherein optical surfaces of said first prism member that are closer to an object side than said intermediate image plane are arranged to correct decentration aberrations as a whole and optical surfaces of said second prism member that are closer to an image-formation plane side than said intermediate image plane are arranged to correct decentration aberrations as a whole so that said intermediate image plane is formed in an approximately planar shape."

With regard to claims 15-18, the Applicant has amended claims 15-18 and deleted the character "-" in the X- and Y- symbols, which was in fact a hyphenation and not a minus sign.

Therefore, Applicant respectfully submits that all pending claims are in full compliance with 35 U.S.C. § 112 and Applicant respectfully requests withdrawal of the rejections of claims 6-12, 14-18 and 25 under § 112, first paragraph and claims 1-5 and 8 under § 112, second paragraph.

Claim rejections – 35 USC 102

The Examiner rejected claims 6-12, 14-18 and 25 under 35 U.S.C. § 102(b) as being anticipated by Nanba et al. ('196). Applicant respectfully traverses this rejection for at least the following reasons.

Claims 6, 7 and 25 have been canceled herein without prejudice or disclaimer. Therefore, the rejection of claims 6, 7 and 25 under § 102(b) is rendered moot.

Claim 8 recites, *inter-alia*, "...said first entrance surface has a curved surface configuration that gives a power to the light beam, said curved surface configuration being a rotationally asymmetric surface configuration that corrects aberrations due to decentration."

In contrast, the optical arrangement of Nanba et al. utilizes a prism which has a surface R1, corresponding to a first entrance surface that is not a rotationally asymmetric surface (see Figure 13 and related description in paragraphs 0096 and 0097 of Nanba et al.). Indeed, the surface R1 is a spherical surface and is expressed by [formula 1]. [formula 1] of Nanba et al. shows that the surface R1 has a curvature radius of -60.000 and thus is a spherical rotationally symmetric surface. Consequently, Nanba et al. does not disclose, teach or suggest "the first entrance surface has a curved surface configuration...said curved surface configuration being a rotationally asymmetric surface configuration,' as recited in claim 8.

Claim 9 recites, *inter-alia*, "...said first exit surface has a curved surface configuration that gives a power to the light beam, said curved surface configuration being a rotationally asymmetric surface configuration that corrects aberrations due to decentration."

In contrast, the optical arrangement of Nanba et al. utilizes a prism which has a surface R9, corresponding to the first exit surface that is not a rotationally asymmetric surface (see Figure 13 and related description in Nanba et al.). Indeed, the surface R9 is a spherical surface having a curvature radius of -35.226. Therefore, the surface R9 is a spherical rotationally symmetric surface. Consequently, Nanba et al. does not disclose, teach or suggest "the first exit surface has a curved surface configuration...the curved surface configuration being a rotationally asymmetric surface configuration," as recited in claim 9.

Claim 14 recites, *inter-alia*, "...said first prism member and said second prism member are arranged to form an intermediate image plane in an optical path between said second reflecting surface and said third reflecting surface."

Figure 2 in Nanba et al. shows a diagram of the arrangement of the first optical element 13. In this Figure, parallel light beams entering the first optical element 13 through a refracting surface 41 exit the first optical element 13 from refracting surface 44 without converging. The first optical element 13 corresponds to the first optical element B1 shown in Figure 13. Consequently, parallel light beams which enter the first optical element B1 will also exit the optical element B1 without converging and reaching the stop R5. Therefore, if an intermediate image can be formed in the optical arrangement of Figure 13 at all, the intermediate image should be formed between the stop R5 and the final image surface R12. However, as shown in Figure 13, no intermediate image is formed between the stop R5 and the final image surface R12. Therefore, Nanba et al. does not disclose, teach or suggest "said first prism member and said second prism member are arranged to form an intermediate image plane in an optical path between said second reflecting surface and said third reflecting surface," as recited in claim 14.

Claims 15-18 recite, *inter-alia*, "said first prism member and said second prism member are arranged to form an intermediate image plane in an optical path between said second reflecting surface and said third reflecting surface."

For at least the reasons provided above with respect to claim 14, Nanba et al. does not disclose, teach or suggest the subject matter recited in claims 15-18.

Therefore, Applicant respectfully submits that claims 8, 9 and 14-18, and claims 10 and 11 which depend from either claim 8 or claim 9, are patentable. Thus, Applicant respectfully requests that the rejection of claims 6-12, 14-18 and 25 under § 102(b) be withdrawn.

Claim rejections – 35 USC 103

The Examiner rejected claims 6-12, 14-18 and 25 under 35 U.S.C. § 103(a) as being unpatentable over Araki et al. ('844) in view of Nanba et al. ('196).

Claims 6, 7 and 25 have been canceled herein without prejudice or disclaimer. Therefore, the rejection of claims 6,7 and 25 under § 103(a) is rendered moot.

Claim 8 recites, *inter-alia*, "...said first entrance surface has a curved surface configuration that gives a power to the light beam, said curved surface configuration being a rotationally asymmetric surface configuration that corrects aberrations due to decentration."

In contrast, the optical arrangement of Araki et al. utilizes a prism which has a surface R2, corresponding to a first entrance surface that is not a rotationally asymmetric surface.

Indeed, Araki et al. states in paragraph [0099] that the surface R2 is a rotationally symmetric spherical surface. Applicant's translation of the portion in paragraph [0099] that supports that statement reads "it should be noted that three refracting surfaces R2, R5 and R8 are all rotationally symmetric spherical surfaces." Consequently, Araki et al. does not disclose, teach or suggest "the first entrance surface has a curved surface configuration...said curved surface configuration being a rotationally asymmetric surface configuration," as recited in claim 8.

As stated above, Nanba et al. also does not disclose, teach or suggest "the first entrance surface has a curved surface configuration...said curved surface configuration being a rotationally asymmetric surface configuration,"

Therefore, for at least this reason, neither Araki et al. nor Nanba et al., alone or in combination, disclose, teach or suggest the subject matter recited in claim 8.

Claim 9 recites, *inter-alia*, "...said first exit surface has a curved surface configuration that gives a power to the light beam, said curved surface configuration being a rotationally asymmetric surface configuration that corrects aberrations due to decentration."

In contrast, the optical arrangement of Araki et al. utilizes a prism which has a surface R8, corresponding to the first exit surface which is not a rotationally asymmetric surface. Indeed, Araki et al. states in paragraph [0099] that the surface R8 is a rotationally symmetric spherical surface (see, the above translation of a portion of paragraph [0099] in Araki et al.). Consequently, Araki et al. does not disclose, teach or suggest "the first exit surface has a curved surface configuration...the curved surface configuration being a rotationally asymmetric surface configuration," as recited in claim 9.

As stated above, Nanba et al. also does not disclose, teach or suggest "the first exit surface has a curved surface configuration...the curved surface configuration being a rotationally asymmetric surface configuration," as recited in claim 9.

Therefore, for at least this reason, neither Araki et al. nor Nanba et al., alone or in combination, disclose, teach or suggest the subject matter recited in claim 9.

Claim 14 recites, *inter-alia*, "...said first prism member and said second prism member are arranged to form an intermediate image plane in an optical path between said second reflecting surface and said third reflecting surface, and ... said intermediate image plane is formed in an approximately planar shape."

Figure 1 in Nanba et al. (submitted herewith as Exhibit A) shows an optical arrangement in which parallel light beams enter a first prism through surface R2. Two parallel light beams converge on a surface R4. Points of convergence of these two parallel light beams are labeled in Exhibit A by the labels "A" and "B" and are indicated with arrows. Another parallel light beam converges between the surface R4 and the surface R5. A point of convergence of this parallel light beam is labeled "C" and is indicated on Exhibit A by an arrow pointing to the point of convergence. As seen in Figure 1 (Exhibit A) of Araki et al. points A, B and C do not fall on a same plane as point C is located outside the plane of A and B. Consequently, the intermediate image plane is not approximately planar, as recited in claim 14.

As stated above Nanba et al. does not disclose, teach or suggest "said first prism member and said second prism member are arranged to form an intermediate image plane in an optical path between said second reflecting surface and said third reflecting surface," as recited in claim 14.

Therefore, for at least this reason, neither Araki et al. nor Nanba et al., alone or in combination, disclose, teach or suggest the subject matter recited in claim 14.

Claim 15 recites, *inter-alia*, "said first prism member and said second prism member are arranged to form an intermediate image plane in an optical path between said second reflecting surface and said third reflecting surface, and wherein, when powers in X and Y directions of an entire optical system are denoted by Px and Py, respectively, and powers in the X direction of the first reflecting surface, the second reflecting surface, the third reflecting surface and the fourth reflecting surface are denoted by Px1-1, Px1-2, Px2-1 and Px2-2, respectively, and further powers in the Y direction of the first reflecting surface, the second reflecting surface, the third reflecting surface and the fourth reflecting surface are denoted by Py1-1, Py1-2, Py2-1 and Py2-2, respectively, the following condition is satisfied: $0.4 < Px1\text{-}1/Px \leq 0.9$ ....(1)."

The condition (1) in claim 15 has been amended to $0.4 < Px1\text{-}1/Px \leq 0.9$. Support for the condition (1) can be found throughout the original disclosure. For example, the Examiner's attention is directed to Example 7 in pages 64-67 in the specification.

Data relating to the optical arrangement shown in Figure 1 of Araki et al. is disclosed in paragraph [0089]. Using the data disclosed in Araki et al., Applicant calculated the values of Px1-1 and Px. The calculated Px1-1 and Px values are as follows:

$$Px1\text{-}1 = 0.28375$$

$$Px = 0.26012$$

The ratio Px1-1 / Px is thus determined:

$$Px1\text{-}1 / Px = 1.091$$

Consequently, the calculated value of the ratio Px1-1 / Px for the optical arrangement of Araki et al. falls outside the range $0.4 < Px1\text{-}1/Px \leq 0.9$ claimed in claim 15.

As stated above, Nanba et al. does not disclose, teach or suggest "said first prism member and said second prism member are arranged to form an intermediate image plane in an optical path between said second reflecting surface and said third reflecting surface."

Therefore, neither Araki et al. nor Nanba et al., alone or in combination, disclose, teach or suggest the subject matter recited in claim 15.

Claim 16 recites, *inter-alia*, "wherein said first prism member and said second prism member are arranged to form an intermediate image plane in an optical path between said second reflecting surface and said third reflecting surface, and wherein, when powers in X and Y directions of an entire optical system are denoted by Px and Py, respectively, and powers in the X direction of the first reflecting surface, the second reflecting surface, the third reflecting surface and the fourth reflecting surface are denoted by Px1-1, Px1-2, Px2-1 and Px2-2, respectively, and further powers in the Y direction of the first reflecting surface, the second reflecting surface, the third reflecting surface and the fourth reflecting surface are denoted by Py1-1, Py1-2, Py2-1 and Py2-2, respectively, the following condition is satisfied: $0.1 < Px1\text{-}2/Px < 0.6$ ....(2)."

Data relating to the optical arrangement shown in Figure 1 of Araki et al. is disclosed in paragraph [0089]. Using the data disclosed in Araki et al., Applicant calculated the values of Px1-2 and Px. The calculated Px1-2 and Px values are as follows:

$$Px1\text{-}2 = 0.15897$$

$$Px = 0.26012$$

The ratio Px1-1 / Px is thus determined:

$$Px1\text{-}2 / Px = 0.611$$

Consequently, the calculated value of the ratio Px1-2 / Px for the optical arrangement of Araki et al. falls outside the range $0.1 < Px1\text{-}2/Px < 0.6$ claimed in claim 16.

As stated above, Nanba et al. does not disclose, teach or suggest "said first prism member and said second prism member are arranged to form an intermediate image plane in an optical path between said second reflecting surface and said third reflecting surface."

Therefore, neither Araki et al. nor Nanba et al., alone or in combination, disclose, teach or suggest the subject matter recited in claim 16.

Claim 17 recites, *inter-alia*, "wherein said first prism member and said second prism member are arranged to form an intermediate image plane in an optical path between said second reflecting surface and said third reflecting surface, and wherein, when powers in X and Y directions of an entire optical system are denoted by Px and Py, respectively, and powers in the X direction of the first reflecting surface, the second reflecting surface, the third reflecting surface and the fourth reflecting surface are denoted by Px1-1, Px1-2, Px2-1 and Px2-2, respectively, and further powers in the Y direction of the first reflecting surface, the second reflecting surface, the third reflecting surface and the fourth reflecting surface are denoted by Py1-1, Pyl-2, Py2-1 and Py2-2, respectively, the following condition is satisfied: $0.37 \leq Px2\text{-}1/Px < 1$ ....(3)."

The condition (3) in claim 17 has been amended to $0.37 \leq Px2\text{-}1/Px < 1$. Support for the condition (3) can be found throughout the original disclosure. For example, the Examiner's attention is directed to Example 7 in pages 64-67 in the specification.

Data relating to the optical arrangement shown in Figure 1 of Araki et al. is disclosed in paragraph [0089]. Using the data disclosed in Araki et al., Applicant calculated the values of Px2-1 and Px. The calculated Px2-1 and Px values are as follows:

$$Px2\text{-}1 = 0.08168$$

$$Px = 0.26012$$

The ratio Px2-1 / Px is thus determined:

$$Px2\text{-}1 / Px = 0.314$$

Consequently, the calculated value of the ratio Px2-1 / Px for the optical arrangement of Araki et al. falls outside the range $0.37 \leq Px2\text{-}1/Px < 1$ claimed in claim 17.

As stated above, Nanba et al. does not disclose, teach or suggest "said first prism member and said second prism member are arranged to form an intermediate image plane in an optical path between said second reflecting surface and said third reflecting surface."

Therefore, neither Araki et al. nor Nanba et al., alone or in combination, disclose, teach or suggest the subject matter recited in claim 17.

Claim 18 recites, *inter-alia*, "wherein said first prism member and said second prism member are arranged to form an intermediate image plane in an optical path between said second reflecting surface and said third reflecting surface, and wherein, when powers in X and Y directions of an entire optical system are denoted by Px and Py, respectively, and powers in the X direction of the first reflecting surface, the second reflecting surface, the third reflecting surface and the fourth reflecting surface are denoted by Pxl-1, Px1-2, Px2-1 and Px2-2, respectively, and further powers in the Y direction of the first reflecting surface, the second reflecting surface, the third reflecting surface and the fourth reflecting surface are denoted by Pyl-1, Py1-2., Py2-1 and Py2-2, respectively, the following condition is satisfied: $0.5 < Px2\text{-}1/Py2\text{-}1 < 2.0$ ....(4)."

Data relating to the optical arrangement shown in Figure 1 of Araki et al. is disclosed in paragraph [0089]. Using the data disclosed in Araki et al., Applicant calculated the values of Px2-1 and Py2-1. The calculated Px2-1 and Py2-1 values are as follows:

$$Px2\text{-}1 = 0.08168$$

$$Py2\text{-}1 = 0.04006$$

The ratio Px2-1 / Py2-1 is thus determined:

$$Px2\text{-}1 / Py2\text{-}1 = 2.039$$

Consequently, the calculated value of the ratio Px2-1 / Py2-1 for the optical arrangement of Araki et al. falls outside the range $0.5 < Px2\text{-}1/Py2\text{-}1 < 2.0$ claimed in claim 18.

As stated above, Nanba et al. does not disclose, teach or suggest "said first prism member and said second prism member are arranged to form an intermediate image plane in an optical path between said second reflecting surface and said third reflecting surface."

Therefore, neither Araki et al. nor Nanba et al., alone or in combination, disclose, teach or suggest the subject matter recited in claim 18.

Therefore, Applicant respectfully submits that claims 8, 9 and 14-18, and claims 10 and 11 which depend from either claim 8 or claim 9, are patentable. Thus, Applicant respectfully requests that the rejection of claims 6-12, 14-18 and 25 under § 103(a) be withdrawn.

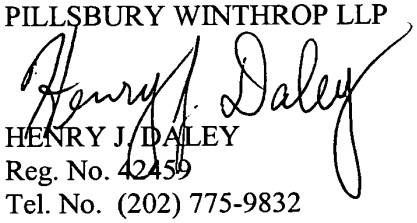
CONCLUSION

In view if the foregoing, the claims are now in form for allowance, and such action is hereby solicited. If any point remains in issue which the Examiner feels may be best resolved through a personal or telephone interview, he is kindly requested to contact the undersigned at the telephone number listed below.

All objections and rejections having been addressed, it is respectfully submitted that the present application is in a condition for allowance and a Notice to that effect is earnestly solicited.

Respectfully submitted,

PILLSBURY WINTHROP LLP



HENRY J. DALEY
Reg. No. 42459
Tel. No. (202) 775-9832
Fax No. 703 905-2500

HJD/KG

00909
P.O. Box 10500
McLean, VA 22102
(703) 905-2000